

NORTH DAKOTA

NPS POLLUTION MANAGEMENT PROGRAM

FISCAL YEAR 2004 ANNUAL REPORT

November 1, 2003 - October 31, 2004

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I. Introduction

The North Dakota Nonpoint Source Pollution Management Program is a voluntary program focused on the reduction and/or prevention of NPS pollution impairing beneficial uses of the state's water resources. Locally sponsored projects and/or initiatives continue to be the primary means by which the NPS Program is implemented across the state. Over the long term, the cumulative benefits realized in the local project areas will assist the ND Department of Health (NDDH) to achieve the long term goals of the NPS Pollution Management Program Plan (Management Plan). The Management Plan mission statement and long term goal are as follows:

North Dakota NPS Program Mission: "To protect or restore the chemical, physical, and biological integrity of the waters of the state by promoting locally sponsored, incentive based, voluntary programs where those waters are threatened or impaired due to nonpoint sources of pollution."

North Dakota NPS Management Program Long-term Goal: "To initiate a balanced program focused on the restoration and maintenance of the beneficial uses of the State's water resources (i.e. streams, rivers, lakes, reservoirs, wetlands, aquifers) impaired by NPS pollution."

Progress toward the longterm goal will be based on the number of watershed restoration projects initiated by 2013. By the 2013 target date, the NPS Program objective is to have 75 watershed restoration projects initiated within the 114 watersheds with water quality limited waterbodies (as identified in the 1998 305(b)). To achieve the long term goal and objective, an average of five watershed restoration projects must be initiated annually. For the short term and annual reporting purposes, positive progress will be gauged, in part, by the number of local watershed restoration projects implemented each year. Other short term measures will include the number of NPS assessment or TMDL development projects initiated as well as the types and amount of public out-reach efforts supported by the program.

During this reporting period, the NPS Program has supported 59 projects with funding provided under the 2003 Consolidated Section 319 Grant (2003 Grant). The budget, status and project period for all the projects are provided in Appendix A. Approximately 9% of the funding under the 2003 Grant has been appropriated for NPS Program staffing and support. The balance of the Section 319 funds, (i.e., 91%), have been allocated to locally sponsored projects focused on NPS pollution control, education or assessment.

Local projects supported with Section 319 funding can be placed under one of four different categories. These project categories are: 1) development phase projects; 2) educational projects; 3) technical support projects; and 4) watershed projects. Under each of these categories, there may also be one or more different project types or subcategories.

The primary purposes of development phase projects are to identify beneficial use impairments or threats within specific waterbodies and determine the extent to which those threats or impairments are due to NPS pollution. Typically, development phase projects involve an inventory of existing data and supplemental monitoring to allow accurate assessment of the targeted waterbody and its watershed. Through these efforts, the local project sponsors are able to: 1) determine the extent to which beneficial uses are being impaired by NPS pollution; 2) identify specific sources and causes of the pollutants; 3) establish preliminary pollutant reduction goals or TMDL's; and 4) identify management measures needed to restore or maintain the beneficial uses of the waterbody. Types of projects under this category include: 1) NPS Assessment Projects; 2) TMDL Development Projects; and 3) Multi-Year NPS Assessment Projects.

Educational projects are designed to increase public awareness and understanding of various NPS pollution issues and/or the solutions to specific NPS pollution concerns. The focus of these educational efforts may range from a local source or cause of NPS pollution to statewide measures that can be initiated to reduce NPS pollution. Educational tools typically used include brochures, all media (TV, radio, newspaper, etc.), workshops, "how to" manuals, tours, exhibits, and demonstrations. Two types of educational projects are currently being delivered in the state. One type is the demonstration projects. These projects focus on the development of on-the-ground demonstrations for educational purposes. The other type of educational project includes the public outreach projects, which are focused on the distribution of information on various local and/or state NPS pollution issues.

Projects designed to deliver technical or financial assistance to other ongoing NPS pollution management projects are identified as "Technical Support Projects." These projects are either statewide or targeted toward a "project area" that includes multiple NPS projects. The primary purpose of these projects is to deliver a specific service or "tool" to locally sponsored NPS projects. Specific types of assistance or management tools being delivered by the technical support projects include: engineering designs; manure management planning, digitized soils, landuse satellite imagery, and wetland restoration/creation support.

The watershed project category is the largest category and includes the most comprehensive projects currently implemented through the NPS Pollution Management Program. These projects are typically long-term efforts designed to address documented NPS pollution impacts and beneficial use impairments within priority watersheds. Common objectives for watershed projects include; 1) protection and/or restoration of impaired beneficial uses through voluntary implementation of best management practices; 2) dissemination of information on local NPS pollution concerns and effective solutions to those concerns; and 3) evaluation of progress toward identified use attainment or NPS pollutant reduction goals. In nearly all cases, the goals and objectives for the watershed projects are identified through implementation of some type of development project (e.g., NPS Assessment Projects, TMDL Development, etc.).

To track progress toward individual project accomplishments each project sponsor is required to submit annual and semiannual reports to the NDDH. These reports are used by the NDDH to document and evaluate progress toward project specific goals. Ultimately, the local projects will also submit a final project report summarizing accomplishments for the entire project period. To fulfill the 2004 annual reporting requirements, all the reports for the local projects have been received and entered in the Grants Reporting and Tracking System (GRTS).

Annual evaluation of the NPS Program is best gauged by the accomplishments and progress towards the goals and objectives identified under each section of the Management Plan. For the 2004 NPS Program annual report, the reporting sections and associated information has been organized to be consistent with the sections in the Management Plan. This section, Section I, identifies the NPS Program long term goal as well as provides a general description of the types of projects supported by the program. Sections II through VII discuss the accomplishments associated with each component of the Management Plan. Information presented in each section will include a discussion on the accomplishments related to the applicable goal and a brief status report for each objective. The six major components of the Management Plan that are addressed in this annual report are as follows:

- Resource Assessment - This section addresses the NPS Program's existing inventory/assessment system and future needs to improve or expand assessment efforts.
- Prioritization - This section discusses existing and future prioritization methods or strategies within the NPS Program.
- Assistance - This section focuses on "how" the financial and technical assistance available through the Program is delivered to state/local project sponsors.
- Coordination - Development and maintenance of partnerships with private and local/state/federal agencies and organizations are described in this section.
- Information/Education - The Program's multi-year strategy for public outreach and information dissemination is described under this section.
- Evaluation/Monitoring - Program and local project evaluation/monitoring efforts are addressed in this section.

II. Resource Assessment

Resource Assessment Goal: To accurately and thoroughly assess beneficial use support and the sources and causes of use impairments within the state's watersheds.

Resource assessment is accomplished at both the statewide and local level. On a statewide basis, data (e.g., water quality, biological, etc.) collected by state and local staff is utilized to evaluate trends in the water quality and beneficial uses of all monitored waterbodies throughout the state.

At the local level, resource managers use watershed-specific data to identify beneficial use impairments within priority waterbodies and/or measure benefits resulting from applied BMP.

The 303(d) list (TMDL List) and 305(b) Reports developed with data collected statewide, are the primary documents used during initial watershed planning efforts. Information in these documents is used to help establish state and local priorities; determine general resource assessment or management needs; and identify areas needing additional evaluation. Future 305(b) Reports will also serve as the primary documents for the evaluation of NPS Program. The 2004 Integrated Report and previous 305(b) reports are available on the NDDH web site <http://www.health.state.nd.us/wq/sw/>.

Locally sponsored NPS assessment or TMDL development projects are the primary means used to determine local watershed priorities and specific management measures. These local assessments, commonly referred to as “development projects,” provide the foundation for all watershed projects by identifying specific sources and causes of NPS pollutants impairing or threatening beneficial uses. This information is used to establish local watershed priorities as well as to develop multi-year project implementation plans (PIP) that address the identified beneficial use impairments. When applicable, NDDH staff also coordinate with the local sponsors to utilize the assessment data to develop TMDLs.

There are two sources of Section 319 financial support for assessment level projects. Generally, the short term NPS Assessment Projects are supported with Section 319 funds available through the NPS Program’s “Development Fund.” Section 319 funds available through the Development Fund are unexpended funds reallocated from other NPS projects that were completed under budget. If the waterbody is also listed on the TMDL List, alternative funding sources (e.g., 604(b); 104(b)(3)) may also be used to support the assessment activities. For the multi-year or basin-wide NPS Assessments, the local sponsors participate in the annual Section 319 grant application process to secure Section 319 support (Base or Incremental Funding) for their projects. Regardless of the source, the match to the Section 319 funding is provided by the local project sponsors.

To achieve the resource assessment goal, the Management Plan identifies four specific objectives. These objectives and a brief status update are as follows:

Objective 1. Complete periodic assessments of the eight digit hydrologic units (HU) in the state.

(Complete) - Assessment of the eight digit HU’s was initially accomplished through the 1998 Unified Watershed Assessment Report. The completion of subsequent Unified Watershed Assessment Reports has been discontinued.

Objective 2. Develop and implement a strategy/process that will allow accurate assessment of the water quality and beneficial use conditions within the state's 12 digit hydrologic units (HU's).

(On Schedule) - The basic strategy being employed by the NPS Program is to deliver the necessary financial and technical assistance to local resource managers to collect the data needed to assess beneficial use impairments associated with NPS pollution. Delivery of this assistance is primarily based on the degree of local interest and commitment rather than pre-determined subwatershed priorities established at the statewide level. If sufficient local interest is demonstrated, technical and financial assistance is provided to establish local subwatershed priorities, develop assessment schedules, and implement assessment activities as scheduled. These local assessment priorities are typically based on the current 303(d) listings, observed conditions, and local public concerns/interest. As the local assessments are initiated, the NDDH also works with the all projects in a "common" river basin to coordinate their data collection and dissemination efforts. Also, when applicable, local subwatershed boundaries are based on the 12 digit hydrologic units.

Objective 3: (Revised 10/03) Establish assessment goals for the local priority watersheds and/or the 12 digit HU's within the six major river basins and develop quality assurance project plans (QAPP's) to assess beneficial use conditions and identify sources and causes of pollutants impairing beneficial uses.

(On Schedule) - Twelve local NPS assessment and/or TMDL development project are currently supported under the 2003 Consolidated Grant. The status of each of the projects is provided in Table 1. When applicable the reports for the completed assessment projects are entered in GRTS under project #5 of the 2004 Grant (008633032).

Objective 4: Assess/evaluate the success of local project efforts (e.g. BMP implementation) to improve water quality and restore and/or maintain the beneficial uses of waterbodies impacted by NPS pollution.

(On Schedule) - NDDH staff have developed QAPP's for all watershed projects supported under the NPS Program. Typically these QAPP's are a continuation of the same plan that was implemented during the assessment phase of the project.

During any year, Objectives 2 and 3 most closely represent the day-to-day efforts being initiated to assess the state's water resources. Specific tasks or activities initiated under these objectives have included local priority setting; development of assessment strategies and QAPP's; interpretation of data; and development of NPS assessment reports. Under the 2003 Consolidated Grant, financial and/or technical assistance has been provided to 12 different assessment phase projects. The specific assessment and/or TMDL development projects are provided in Table 1.

Table 1. NPS Assessment and TMDL Development projects supported under the 2003 Consolidated Grant

Project Name	319 Allocation	Status *	End Date
Armourdale Dam TMDL Development	\$4,055	Complete	4/30/04
Bear/Bonehill Creek Assessment	\$15,253	Complete	12/31/03
Blacktail & McGregor TMDL Development	\$15,000	Active	6/30/05
Carbury Dam TMDL Development	\$6,184	Complete	5/31/03
Cass Co. - Three Rivers Assessment	\$70,930	Active	6/30/06
Phase II - Dickinson Dike TMDL Development	\$1,000	Active	6/30/05
Phase I - Dickinson Dike TMDL Development	\$6,853	Complete	6/30/03
Lake Hoskins Assessment Project	\$18,066	Complete	9/30/04
McDowell Dam TMDL Development	\$22,688	Complete	6/30/04
Northgate Dam TMDL Development	\$10,825	Active	6/30/05
Ransom Co. Sheyenne River Assessment	\$86,644	Active	6/30/05
Red River Basin Volunteer Monitoring Pilot Program	\$22,829	Active	6/30/05
Upper Goose River Assessment Project	\$71,616	Active	6/30/07
Total	\$351,943		

* Active or complete indicates the “status” of Section 319 financial support for the collection of the data needed to develop the NPS pollution assessment report and/or TMDL.

III. Prioritization

Prioritization Goal: Based on the most current inventory and assessment data, prioritize the state’s waterbodies/watersheds for future NPS pollution assessment or abatement efforts.

The NPS Program utilizes a “process” rather than a “physical list” (with the exception of the TMDL List) to identify local waterbody priorities. On a statewide basis, the waterbodies included on the TMDL List are considered high priority waterbodies for the development and implementation of watershed assessments. At the local level the TMDL listed waterbodies are also considered a high priority, although local resource managers may also establish priority rankings for waterbodies not included on the TMDL List. For waterbodies lacking data and/or omitted from the TMDL List, a two step process is used to establish priorities. The first step involves a review of current information (i.e., obtained through local feedback; the 1999 UWA; 305(b) Reports; NDDH; USGS; NRCS; etc.) to establish a preliminary ranking for each subwatershed in the project area. These rankings, which are either a Tier II or III ranking, are used to indicate the type of management or assessment activities needed in each subwatershed. The Tier II waterbodies are generally those that are on the TMDL List, while the Tier III waterbodies are those with very minimal to no data. The second phase focuses on the development of a local priority schedule for the implementation of the appropriate subwatershed

assessment or management activities.

The Tier II and III waterbodies always require the collection of some type of additional data to accurately identify beneficial use impairments and/or determine the sources and causes of pollutants impairing beneficial uses. For these waterbodies, the local sponsors coordinate with NPS Program staff to determine data collection needs and establish a priority schedule for assessing the waterbodies. Following this prioritization process, financial and/or technical assistance is provided to the sponsors to develop and implement quality assurance project plans (according to the priority schedule) to collect the necessary data. This data is used to identify NPS pollutant sources and causes, document beneficial use impairments; and determine management needs in the watersheds. All the projects listed in Table 1 are addressing Tier II or III waterbodies.

Tier I waterbodies have sufficient data to identify beneficial use impairments as well as the sources and causes of those impairments. Local sponsors typically recognize the Tier I waterbodies as their highest priority. In such cases, the local sponsors seek the appropriate financial assistance (i.e., Section 319 funding, EQIP funding, etc.) to implement a comprehensive watershed restoration plan. The Tier I waterbodies and watersheds currently being addressed with Section 319 funding are listed under the Watershed Projects in Appendix A.

The NPS Management Plan lists two specific objectives for accomplishing waterbody prioritization at the state and local level. These objectives and a brief summary of actions this past year are as follows:

Objective 1: At the basin and/or local level, categorize specific waterbodies into one of the three Tier rankings.

(On Schedule) - As previously indicated, the TMDL List is the “waterbody priority” list being used by the NPS Program. The most recent TMDL List can be found in the 2004 Integrated Report. This report is on the ND Department of Health’s web site. The web address is <http://www.health.state.nd.us/wq/sw>. Local resource managers and project sponsors are also using the TMDL List and other information to establish assessment priority rankings and schedules. Projects listed in Table 1 are high priority Tier II or III watersheds currently being monitored and evaluated with financial support provided through the 2003 Consolidated Grant. Watershed projects included in Appendix A are previous assessment projects (Tier II or III) that are now recognized as Tier I waterbodies. All watershed projects listed in either table were initially identified through a local prioritization effort involving local resource managers and NPS Program staff.

Objective 2: Establish priority rankings for each of the Tier I, II, and III subwatersheds within local project areas and/or the six major river basins in the state.

(Revised) - The scheduling and implementation of the appropriate actions is being accomplished with priority rankings limited to Tier I, II, or III. Prioritization within each Tier is not needed to further define local assessment or watershed implementation schedules. As a result, given the similarities between Objective 1 and 2 and limited need for rankings within each Tier, Objective 2 and its Tasks have been incorporated into Objective 1.

IV. Assistance

Assistance Goal: Provide sufficient financial and technical assistance to local resource managers (e.g. SCDs, WRBs) to ensure accurate identification of beneficial use and water quality impairments resulting from NPS pollution and effective development and completion of projects that will restore and/or maintain the beneficial uses of waterbodies impacted by NPS pollution.

The number of projects initiated and/or maintained on an annual basis is one of the main factors for evaluating successful delivery of NPS Program financial and technical assistance. This assistance generally starts with the development of the project implementation plans and continues throughout the implementation period of the projects. Various types of assistance being provided to local projects on an annual basis include: project oversight; sample analysis; PIP review and comment; sample collection and project management training; quality assurance project plan development; distribution of educational materials; biological monitoring support; and Section 319 financial support. NDDH personnel involved in the delivery of NPS Program financial and technical assistance are as follows:

- Water Quality Division Director & Surface Water Program Manager - Program Supervision (0.70 FTE)
- NPS Program Coordinator - Program Administration (1 FTE)
- Environmental Scientist - Monitoring/Assessment Assistance (2.5 FTE)
- Watershed Planning & Information/Education Coordinator - I/E Assistance (1 FTE)
- Microbiology and Chemistry Lab Personnel - Sample Analysis (4 FTE)
- Ground Water Program Personnel - Aquifer Assessment Project (2 FTE)
- Secretarial Assistance (0.5 FTE)

Specific roles of NDDH staff involved in the NPS Program are described in the current NPS Program Staffing and Support Workplan - October 1, 2004 - January 31, 2006. On an annual basis, approximately, 9% of the NPS Program budget is used to support NDDH staff involved in NPS Program delivery. Total expenditures for NPS Program staffing and support under the 2003 Consolidated Grant are provided in Table 2.

Table 2. Estimated NPS Program Staffing & Support Expenditures - January 1, 2003 thru September 31, 2004.

<u>Cost Category</u>	<u>Section 319 Funds</u>	<u>State Match</u>	<u>Total Expenditures</u>
Personnel Salaries	\$383,870.75	\$255,913.84	\$639,784.59
Fringe Benefits	\$126,878.06	\$84,585.37	\$211,463.43
Travel	\$31,442.79	\$20,961.86	\$52,404.65
Equipment	\$7,810.79	\$5,207.20	\$13,017.99
Supplies	\$32,782.51	\$21,855.01	\$54,637.52
Other (phone, postage, rent, misc.)	\$36,212.88	\$24,141.92	\$60,354.80
<u>Indirect</u>	<u>\$48,208.80</u>	<u>\$32,139.20</u>	<u>\$80,348.00</u>
TOTAL	\$667,206.58	\$444,804.40	\$1,112,010.98

To date, NPS Program staff have assisted with the development and implementation of 59 projects that have been or are being supported under the 2003 Grant. Appendix A provides the approved budgets for all the projects. The 2004 annual reports for each of the projects have been submitted to the NPS Program and are provided in the GRTS (i.e., 1999-2004 Grants).

Projects supported under the 2003 Grant can be grouped under one of eight different NPS project types or subcategories. These subcategories are an expansion of the project categories previously discussed in Section I. Inclusion of a project in a particular subcategory is based on the primary goals of the project. For example, projects included in the “Development Phase - NPS Assessment” subcategory are designed to document the sources and causes of NPS pollutants impairing beneficial uses, while projects included in the Watershed subcategory are designed to address those documented impairments through BMP implementation.

Grouping projects according to a “common goal” allows the opportunity to evaluate overall balance and emphasis of the NPS Program. Based on this, the NPS Program is targeting a majority of its resources to initiatives designed to assess NPS pollution impacts and/or implement the appropriate corrective measures. This focus is consistent with the NPS Program’s watershed restoration goals. Table 3 lists the cumulative expenditures and distribution of costs between the different NPS project types or subcategories during the period of January 1, 2003 through September 30, 2004.

Table 3. Section 319 Allocations and Expenditures per Project Subcategory: January 1, 2003 - September 30, 2004.

<u>Project Type</u>	<u>Cumulative 319 Allocation</u>	<u>Cumulative 319 Expenditures</u>	<u>Percent Of Total 319 Expenditures</u>
Development Phase - NPS Assessment	\$1,067,184	\$140,107	1.95%
Development Phase - TMDL Development	\$66,605	\$59,962	0.83%
Education - Demonstration	\$918,746	\$482,985	6.72%
Education - Public Outreach	\$2,012,346	\$782,401	10.89%
Local Project Support (TA or FA)	\$5,090,032	\$1,284,788	17.89%
NPS Assessment - Multi Year Grant Award	\$216,180	\$117,708	1.64%
NPS Program Staffing And Support	\$876,000	\$667,207	9.29%
<u>Watershed Project</u>	<u>\$14,487,527</u>	<u>\$3,646,971</u>	<u>50.78%</u>
Totals:	\$24,734,620	\$7,182,129	

NPS Program staff have also assisted with the development of PIP's for 10 new or continuation projects requesting FY 2005 Section 319 funding. The draft PIP's were reviewed by the NPS Task Force in August and September 2004. The updated and final PIP's for the project's are scheduled to be reviewed by the Task Force in December 2004. All final PIP's approved by the Task Force will be forwarded to EPA for final funding consideration and approval in January 2005.

NPS Program financial and technical assistance has continued to be directed toward a variety of local initiatives and/or projects that are designed to help accomplish the "Assistance Objectives" identified in the Management Plan. These program objectives and a brief summary of related actions this past year are as follows:

Objective 1: Increase the ability of potential sponsors to determine their local NPS pollution management needs and develop strategies or plans that will effectively address those NPS pollution concerns.

(On Schedule) - Local meetings have continued to be the primary means used to communicate to local resource managers and assist with their watershed planning needs. NDDH staff have been involved in numerous such meetings the past year. A majority of these local meetings have been with soil conservation districts and/or water resource boards. Informational materials have also been distributed to local sponsors and other resource managers throughout the year.

Objective 2: Provide financial and technical assistance to local project advisory committees to develop and implement NPS assessment or TMDL development projects to document local or basin-wide subwatershed priorities and establish specific subwatershed Tier rankings.

(On Schedule) - Table 1 lists all the NPS Assessment and TMDL development projects supported under the 2003 Grant. When available, the final reports for the completed

assessment projects have been entered in the GRTS under the NPS Development and Assessment Projects (i.e., Project #5) of the 2004 grant year (008633032).

Objective 3: Provide financial and technical assistance to local sponsors for the development and implementation of watershed projects addressing the highest priority Tier I waterbodies.

(On Schedule) - Appendix A lists all the watershed projects currently supported under the 2003 Grant. Four new watershed projects are also being considered for FY05 Section 319 funding. Final approval of the new watershed projects is expected to be issued by EPA in February/March 2005.

Objective 4: Expand sources of financial assistance for NPS pollution projects to reduce local sponsors' match responsibilities and/or the level of Section 319 assistance needed.

(Behind Schedule) - Locally generated cash and/or inkind match continues to be the primary means by which the state's Section 319 match responsibilities are met. This local support is generally provided by soil conservation districts, water resource boards and participating producers.

As of this reporting period, a long term commitment to partially support local NPS projects with state general funds has not been realized. However, some local projects have received non-federal match support this past year through the State Water Commission Trust Fund (SWC Funds) and the ND Game & Fish Department's Save Our Lakes (SOL) Program.

Through the SWC Fund, \$200,000 have been appropriated to five locally sponsored Section 319 projects. These SWC funds were provided to the projects to help support costs for engineering designs for animal feeding operations. These funds were only allocated for the 2004/2005 biennium and the availability of these funds after the biennium is currently uncertain.

The SOL Program has expended approximately \$30,000 to partially support the installation of BMP's within four NPS project areas this past year. The main type of BMP's installed have included manure management systems and lake shore stabilization. The SOL Program is expected to be funded in future years and should serve as a dependable non-federal funding source for supporting BMP implementation.

Objective 5: Maintain post-project NPS pollution management efforts and document long-term benefits of NPS pollution control and/or water quality improvement practices applied within the project areas.

(Discontinued) - Due to time constraints, NPS Program monitoring efforts have been limited to the evaluation of active NPS projects. As a result, Objective 5 and its tasks have been discontinued. Initiation of this objective will be reevaluated annually.

V. Coordination

Coordination Goal: Increase the effectiveness of NPS pollution management in the state by coordinating project development and implementation efforts with local, state, and federal agencies and private organizations involved with natural resource management in the state.

Initiation and maintenance of a coordinated effort with the appropriate entities is one of the most important activities within the local project areas. At the onset of the projects, the lead sponsors are encouraged to solicit the involvement of all groups or agencies that may have an interest in the planned project. For most projects, the involvement of multiple entities has helped ensure the appropriate expertise is available and in some cases, helped the projects gain additional financial support.

Given the agricultural focus of most projects, local Soil Conservation Districts (SCD) are the lead sponsor for a majority (54%) of the current NPS projects. The SCD's provide the local leadership that is necessary to implement and manage projects as well as the "familiar face" to ensure effective communication with agricultural producers. However, as the diversity of the NPS Program has expanded, an increasing number of projects are being sponsored by other local or regional organizations such as universities; state agencies, lake associations, resource conservation and development councils, and water resource boards.

Generally, all the lead sponsors establish some type of Project Advisory Committee (PAC). These PAC's assist with project development and management as well as provide additional expertise to help ensure the projects stay focused on identified NPS pollution concerns. Typical groups or organizations represented on these advisory committees include; NRCS, City Councils, County Commissions, Extension Service, Wildlife Groups, and Water Resource Boards.

Indirectly, the NPS Task Force has also helped strengthen coordination between NPS projects and similar programs sponsored by other state or federal agencies and organizations. Through the annual project review process, the Task Force is involved in the development of all NPS projects initiated in the state. During this process, the Task Force members become aware of the goals and objectives of all the local NPS projects, which in turn, enables them to recognize and act on partnership opportunities for projects/programs managed by their agency or organization. The review process has also helped local sponsors gain a better understanding of what the Task Force member agencies can offer to local NPS pollution management projects.

NPS Program efforts to establish and expand coordination at the state and local level is essentially accomplished through two main objectives. These objectives and a brief summary of activities the past year are as follows:

Objective 1: Expand local participation in the prioritization, development, and implementation of NPS pollution management projects

(On Schedule) - The primary task under this objective focuses on the development and maintenance of project advisory committees. Currently, most if not all, the NPS projects have established an advisory committee to provide input on project management and delivery. Although most committees include several different groups and organizations, the most “active” participants have typically been the local SCD and WRB, as well as NRCS field office staff. Other groups that are invited to participate on most committees include County Commissions, Extension Service, and City Councils.

Initially the formation of Basin Management Committees was scheduled under this section of the Management Plan. At this time, it is not feasible to form basin level committees until more local advisory committees are formed in each river basin. As additional advisory committees are established, NPS Program staff will assist any interested advisory committees with the formation of a Basin Management Committee.

Objective 2: Maintain partnerships and communication with the appropriate local, state, and federal agencies, and private organizations to coordinate resources and ensure other natural resource management efforts are consistent with the state’s NPS pollution management goals.

(On Schedule) - State level coordination and information dissemination has continued to be accomplished through the NPS Task Force meetings and newsletter as well as through participation on other review committees such as the NRCS State Technical Committee.

VI. Information and Education

Information and Education Goal: Increase North Dakota residents’ understanding of the water quality and beneficial use impairments associated with NPS pollution and strengthen public support for the voluntary implementation of NPS pollution control activities.

A variety of educational efforts are supported annually to increase public understanding of NPS pollution as well as to strengthen support for current and future NPS pollution management projects. These educational efforts include activities such as newsletters, workshops, demonstrations, tours, fact sheets, radio ads, and videos. Generally, the information/education (I/E) efforts are sponsored and implemented by local entities such as soil conservation districts, water resource boards, and NDSU Extension Service. Although the goals and target audience of the different educational projects may vary, cumulatively these state/locally sponsored I/E projects form a balanced statewide NPS pollution education program.

Under the 2003 Grant, approximately 17% of total Section 319 expenditures have been associated with the implementation of I/E projects. Through this support, multiple educational events have been conducted, including events such as K-12 lyceums; BMP demonstrations,

workshops for livestock producers, and water quality training for teachers. Appendix A lists the I/E projects supported under the 2003 Grant. The descriptions and 2004 annual reports for each I/E project are provided in the GRTS.

Most technical support projects (see Appendix A) also have a significant educational component or provide tools to support local educational efforts. These supporting activities ultimately help enhance and strengthen the state's public education efforts. Although the technical support projects have not been designed to focus solely on public out-reach, they do expend a significant amount of time and resources to develop materials or tools that can be used for educational purposes. Some of the technical support projects serving this I/E supporting role include: 1) Aquifer Denitrification Assessment; 2) Groundwater Sensitivity Mapping; 3) NDSU Satellite Imagery Applications to Water Quality Protection; and 4) Digital Taxonomic Keys for Aquatic Insects in ND. More detailed descriptions of the I/E activities initiated by these support projects are provided in the 2004 annual reports for each project. These annual reports are provided in the GRTS.

NPS Program staff have also been involved in numerous educational events over the past year. These efforts have included presentations at local tours and workshops, display booths at county fairs and agricultural shows; instruction at ECO ED camps, assistance with Envirothon competitions, newsletter articles; and dissemination of various materials. Generally, most NPS Program I/E efforts have been associated with one of the locally sponsored I/E projects listed in Appendix A.

Successful delivery of the NPS I/E Program involves five main objectives. These objectives and a summary of associated activities this past year are as follows:

Objective 1: Assess the general public's knowledge of NPS pollution issues.

(On Schedule) - Surveys were taken at the NPS informational booth in the spring of 2004. In addition, interaction with numerous visitors at the booth has provided valuable insight on the type of information and materials the general public is seeking..

Objective 2: Deliver a balanced statewide I/E Program that addresses NPS pollution issues in the state and is targeted toward all age groups.

(On Schedule) - The I/E program has a well developed youth education component that addresses K-12 students. The main long term youth education projects include the ECO ED Camp, Envirothon Program, The Regional Environmental Education Series (TREES) and Project WET. The 2004 annual reports for each of these projects are available in the GRTS.

NPS Program staff have participated in several local functions that targeted both youth and adult audiences. Two of the more successful events were the Richland/Wilkin County Soil Conservation Districts' "Ladies Ag Nite" and the Harmon Lake Watershed

Day sponsored by Morton County. In another effort to improve the offerings to our adult audience, the first Nonpoint Source Pollution Watershed Management Institute was held in August 2004. Over 40 people attended the workshop. A majority of these attendees were SCD staff or supervisors. Exit surveys indicated there would be interest in attending follow-up workshops. NPS pollution related magazine articles and the quarterly publications of the Quality Water Newsletter were also completed this reporting period..

Objective 3: Based on public input and reviews of existing I/E efforts, expand or develop new NPS pollution/water quality I/E activities and materials to ensure the appropriate and sufficient information is available to the residents of the state.

(On Schedule) - Most I/E events are initiated in response to public input or requests. Two examples of this are the Nonpoint Source Pollution Watershed Management Institute previously mentioned and the Devils Lake Watershed workshop for teachers. The ND Project WET Program designed the new teacher workshop in the Devils Lake Watershed to focus on water quality and the persistent flooding problems in the basin.

NPS Program staff also developed and presented ten informational spots that were aired on a regional, combined TV/Radio show called "Country Morning." Some of the subjects discussed include: watersheds, livestock waste management, AFO/CAFO regulations, urban water quality, and the NPS Pollution Program.

Objective 4: Deliver a consistent and balanced I/E Program across the state by coordinating with various federal, state, local, and private organizations and/or agencies to develop and implement I/E projects focused on priority NPS pollution management issues in the state.

(On Schedule) - Coordination with NRCS, Extension Service, Soil Conservation Districts and other agencies to achieve this objective is an ongoing effort accomplished through direct mailings, meetings, participation in events, etc.

Objective 5: Evaluate public awareness of NPS pollution issues in the state to determine the effectiveness of the I/E Program and identify additional activities needed to strengthen the program.

(On Schedule) - Determination of educational needs and focus is an ongoing effort. Generally, through interaction at the NPS display booth, meetings, and other events, NPS Program staff have been able to can identify educational priorities. Feedback within the local projects has also been helpful for evaluating educational needs.

VII. Program Evaluation

Evaluation Goal: Evaluate the successes and failures of the NPS Management Program and identify the necessary updates to the NPS Pollution Management Program to maintain successful

delivery of financial and technical assistance to local and state agencies and private organizations addressing NPS pollution.

The overall success or benefits of the NPS Program will be evaluated at both the state and local level. At the state level, success will be measured by the degree of progress toward goals set in the Management Plan. Locally, progress or success will be based on project-specific goals and objectives. At either level, short and long term measures will be used to document project or program accomplishments.

The long term goal of the NPS Program is to deliver a balanced program focused on the restoration and maintenance of beneficial uses impaired by NPS pollution. The 1998 305(b) Report and Section 303(d) list are the baseline documents that will be used to measure progress toward this goal. Development and implementation of watershed restoration projects in 75 of the “impaired” watersheds included on the 1998 303(d) list is the main objective being implemented to achieve the long term goal. This objective is scheduled to be met by 2013 through the completion of the objectives and tasks for each key element (Assessment, Prioritization, etc.) in the Management Plan. With over 20 watershed projects currently supported under the 2003 Grant, the program’s main objective should be realized by 2013.

The 305(b) Reports developed after 1998 will be used to evaluate statewide, long term benefits of the NPS Program. NPS pollution data summaries and other information in future 305(b) Reports will be compared to similar data presented in the 1998 305(b) Report. This comparative analysis will be used to identify and document any NPS pollution trends on a statewide basis. Statewide program success will be defined by the percent decrease in waterbodies listed as “impaired by NPS pollution” in the 1998 305(b) Report versus 2013 305(b) Report.

The local watershed projects offer the best opportunities to measure and track on-the-ground accomplishments supported with Section 319 funding. Although, other types of projects, such as the educational projects, also measure progress toward established goals, the watershed projects are the only projects where water quality/quantity and landuse data is collected for evaluation purposes. Over the long term, the data collected within the local watersheds will be used to evaluate local project success as well as statewide benefits.

Typically, over 500 water quality samples are collected annually within the state’s active watershed project areas. The main parameters that are monitored include nitrogen, phosphorus, total suspended solids, and fecal coliform bacteria. This annual data, is being used to establish a long term water quality record for all the watershed projects supported with Section 319 funding. A map of the watershed projects supported through the NPS Program is provided in Appendix B. Upon completion of a project, the appropriate data is interpreted and a summary of the results is incorporated into the applicable final project report in the GRTS. This same data will also be summarized in future 305(b) Reports to document long term NPS pollution trends in the state.

Despite the application of multiple BMP’s and the collection of extensive water quality data, accurate documentation of annual pollutant reductions has proven to be very difficult within the

state's large watershed project areas. As an example, Cottonwood Creek Watershed is a 100,000 acre watershed in which water quality data has been collected for nine years from 4 different STORET sites. During this same period, numerous BMP's have also been applied to meet the project's land use improvement goals. Preliminary review of data collected to date, does indicate a positive trend in water quality conditions within the project area. However, due to annual variations in weather, stream flow, and other natural factors it is still very difficult, if not impossible, to accurately quantify the annual reductions for any of the water quality parameters. A brief summary of the Cottonwood Creek Watershed Project data is provided in Appendix C. Based on these experiences, it is anticipated, a 10+ year data set will be needed to accurately and confidently document actual pollutant reductions within Cottonwood Creek watershed as well as most other large watershed projects. Consequently, future measurement of short term (e.g., annually) progress within large watershed project areas will be based more on modeled (i.e., AGNPS, BASINS) benefits of applied BMP's rather than actual measured reductions in nearby waterbodies.

Given the difficulties in quantifying actual annual load reductions, evaluation of progress within the watershed projects is primarily based on the types and amounts of applied BMPs. To date, as indicated in Figure 1, forty two percent (42%) of total Section 319 expenditures under the 2003 Grant have been associated with the implementation of BMPs. The most common BMP's implemented with this financial support have included no-till residue management; nutrient management; manure management systems and grazing management practices. The main NPS pollutants addressed by these BMPs include nitrogen, phosphorus, sediment, and fecal coliform bacteria. Figure 2 lists the expenditures under each BMP Category and Appendix D provides a summary of the specific BMPs applied and supported since January 1, 2003.

Figure 1. Cumulative line item expenditures of projects supported under the 2003 Grant - January 1, 2003 thru September 30, 2004.

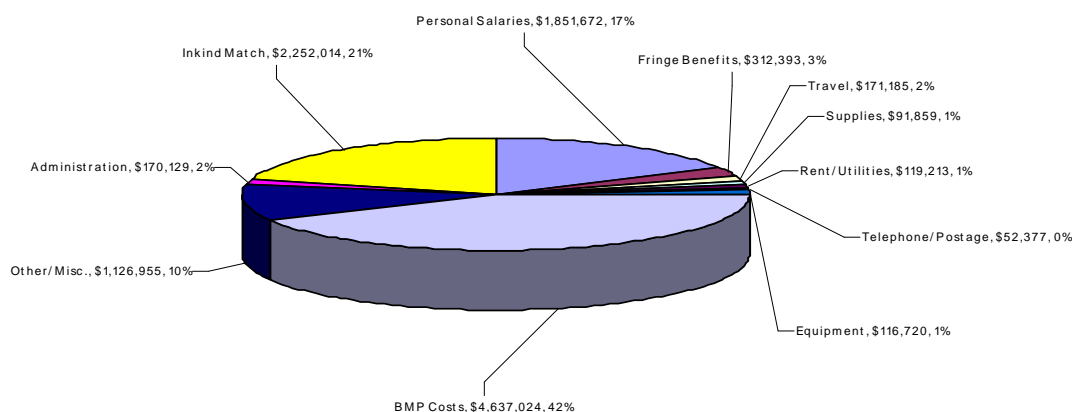
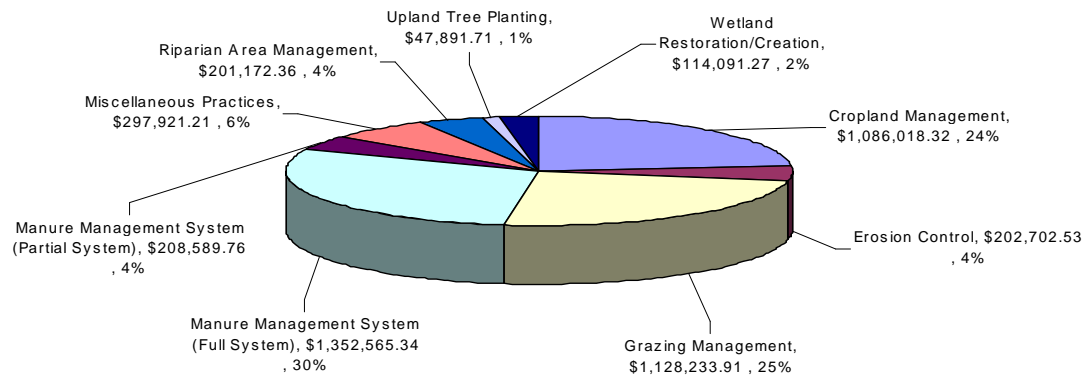


Figure 2. BMP Category Expenditures under the 2003 Grant - January 1, 2003 thru September 30, 2004.



As previously indicated, the NPS Program has increased the use of computer modeling during the assessment and implementation phases of watershed projects. This is particularly true for projects targeting waterbodies on the TMDL List. Over the past year, AGNPS or BASINS modeling was being used within nearly all the assessment or development phase projects listed in Table 1. To provide better assistance to the local projects, NPS Program staff have also participated in various modeling workshops. As skill levels increase at the state and local level, it is expected all future NPS watershed projects will use computer modeling to identify land management needs as well as to predict annual pollutant reductions resulting from applied BMP.

NPS Program evaluation involves three specific objectives. These objectives and a summary of activities the past year are as follows:

Objective 1: Assess and document beneficial use impairments in the state's surface and ground water resources resulting from NPS pollution and, to the extent possible, identify current and future sources and causes of the use impairments or threats.

(Discontinued) - For the purposes of statewide assessment and evaluation, the NPS Assessment Report has been replaced with the 305(b) Reports. Local NPS assessment reports or TMDL's are also used for watershed-specific evaluation and planning.

Objective 2: Maintain effective delivery of the NPS Program by conducting periodic reviews of Program accomplishments.

(On Schedule) - Input on program delivery is provided by local project sponsors through their annual project reports. The 2004 annual reports for all local projects are in the GRTS. During the upcoming year, the NPS Task Force will also help evaluate program progress and provide recommendations for updates to the Management Plan. An updated Management Plan is tentatively scheduled to be completed by the fall of 2005.

Objective 3: Evaluate local NPS project progress toward goals identified in the PIP's.

(On Schedule) - All data collected within the local project areas is compiled by the NDDH and entered in STORET. As the projects are completed, the applicable data is interpreted to evaluate progress toward quantified goals and objectives. Appendix C provides an example of a data summary from one STORET site within the Cottonwood Creek Watershed project. This is the type of information that is included in the final project reports to document project progress and benefits. All final project reports have been entered in GRTS as they are completed

Although, the statewide benefits of the NPS Program cannot be easily measured, data from some local projects does suggest Section 319 funding is having a positive impact on water quality in the state. Over the long term, as the applied BMP mature and additional projects are initiated, statewide reductions in NPS pollution should begin to be realized. Continued and expanded coordination with USDA and other natural resource agencies will also be a key factor for ensuring measurable progress is realized statewide by 2013.

Appendix A
Budgets & Status of Projects Supported Under the 2003 Consolidated Grant

Active and Completed Projects Under the 2003 Section 319 Consolidated Grant

January 1, 2003 - September 30, 2004

Development Phase - NPS Assessment

<u>Project</u>	<u>Status</u>	<u>319 Allocation</u>	<u>Local Match</u>	<u>Total Budget</u>	<u>Start</u>	<u>End</u>
Bear/Bonehill Creek Assessment	Completed	\$15,253	\$10,169	\$25,422	1/1/2002	12/31/2003
Cass - Three Rivers Education & Assessment Watershed Project	Active	\$70,930	\$47,287	\$118,217	1/1/2004	6/30/2006
Lake Hoskins Water Quality Assessment	Completed	\$18,066	\$12,044	\$30,110	1/1/2003	9/30/2004
Ransom C. Sheyenne River Assessment	Active	\$86,644	\$57,763	\$144,407	1/1/2002	6/30/2005
Red River Basin Volunteer Monitoring Network	Active	\$22,829	\$15,219	\$38,048	4/1/2004	6/30/2005
Unobligated Development Phase Fund	Active	\$781,846	\$521,231	\$1,303,077	7/1/1999	6/30/2009
<u>Upper Goose River Watershed Assessment Project</u>	<u>Active</u>	<u>\$71,616</u>	<u>\$47,744</u>	<u>\$119,360</u>	<u>10/1/2004</u>	<u>6/30/2007</u>
Subtotal		\$1,067,184	\$711,456	\$1,778,640		

Development Phase - TMDL Development

<u>Project</u>	<u>Status</u>	<u>319 Allocation</u>	<u>Local Match</u>	<u>Total Budget</u>	<u>Start</u>	<u>End</u>
Armourdale Dam TMDL	Completed	\$4,055	\$2,703	\$6,758	10/1/2002	4/30/2004
Blacktail & McGregor TMDL Development Projects	Active	\$15,000	\$10,000	\$25,000	5/1/2003	6/30/2005
Carbury Dam TMDL	Completed	\$6,184	\$4,123	\$10,307	10/1/2002	5/31/2003
Dickinson Dike TMDL Development - Phase II	Active	\$1,000	\$667	\$1,667	4/1/2004	6/30/2005
Dickinson Dike TMDL Development - Phase I	Completed	\$6,853	\$4,569	\$11,422	3/1/2003	6/30/2003
McDowell Watershed TMDL	Completed	\$22,688	\$15,125	\$37,813	7/1/2002	6/30/2004
<u>Northgate Dam TMDL</u>	<u>Active</u>	<u>\$10,825</u>	<u>\$7,217</u>	<u>\$18,042</u>	<u>10/1/2002</u>	<u>6/30/2005</u>
Subtotal		\$66,605	\$44,403	\$111,008		

Education - Demonstration

<u>Project</u>	<u>Status</u>	<u>319 Allocation</u>	<u>Local Match</u>	<u>Total Budget</u>	<u>Start</u>	<u>End</u>
Kelly Creek Water Quality Improvement Demonstration	Completed	\$7,860	\$5,240	\$13,100	7/1/2000	9/1/2003
<u>SW North Dakota NPS/Water Quality I&E Project</u>	<u>Active</u>	<u>\$910,886</u>	<u>\$607,257</u>	<u>\$1,518,143</u>	<u>3/1/1997</u>	<u>6/30/2006</u>
Subtotal		\$918,746	\$612,497	\$1,531,243		

Education - Public Outreach

<u>Project</u>	<u>Status</u>	<u>319 Allocation</u>	<u>Local Match</u>	<u>Total Budget</u>	<u>Start</u>	<u>End</u>
Digital Taxonomic Keys for Aquatic Insects in ND	Active	\$76,520	\$51,013	\$127,533	4/1/2001	6/30/2006
Envirothon Program	Active	\$45,778	\$30,519	\$76,297	4/1/2001	6/30/2006
Foster County - TREES Program	Active	\$390,118	\$260,079	\$650,197	7/1/1999	6/30/2007
NDSU Livestock Waste Technical Information & Assistance Program	Active	\$737,065	\$491,377	\$1,228,442	3/1/1997	6/30/2006
Project WET	Active	\$201,727	\$134,485	\$336,212	10/1/1993	6/30/2005
<u>Statewide ECO ED Camp</u>	<u>Active</u>	<u>\$561,138</u>	<u>\$374,092</u>	<u>\$935,230</u>	<u>3/1/1997</u>	<u>6/30/2008</u>
Subtotal		\$2,012,346	\$1,341,564	\$3,353,910		

Local Project Support (TA or FA)

<u>Project</u>	<u>Status</u>	<u>319 Allocation</u>	<u>Local Match</u>	<u>Total Budget</u>	<u>Start</u>	<u>End</u>
Adams Co. Livestock Manure Management Program	Active	\$929,793	\$619,862	\$1,549,655	5/1/2004	6/30/2009
Dairy Pollution Prevention Program	Active	\$1,413,558	\$942,372	\$2,355,930	4/1/2000	6/30/2009
Groundwater Sensitivity Mapping	Active	\$669,648	\$446,432	\$1,116,080	4/1/2001	6/30/2005
Livestock Facility Assistance Program	Active	\$280,729	\$187,153	\$467,882	11/1/2001	6/30/2006
ND Waterbank Program	Active	\$239,035	\$159,357	\$398,392	10/1/1999	6/30/2005
NDSU Satellite Imagery Applications for WQ Protection	Active	\$152,272	\$101,515	\$253,787	6/1/2000	6/30/2005

NPS Assessment - Multi Year Grant Award

NPS Program Staffing And Support

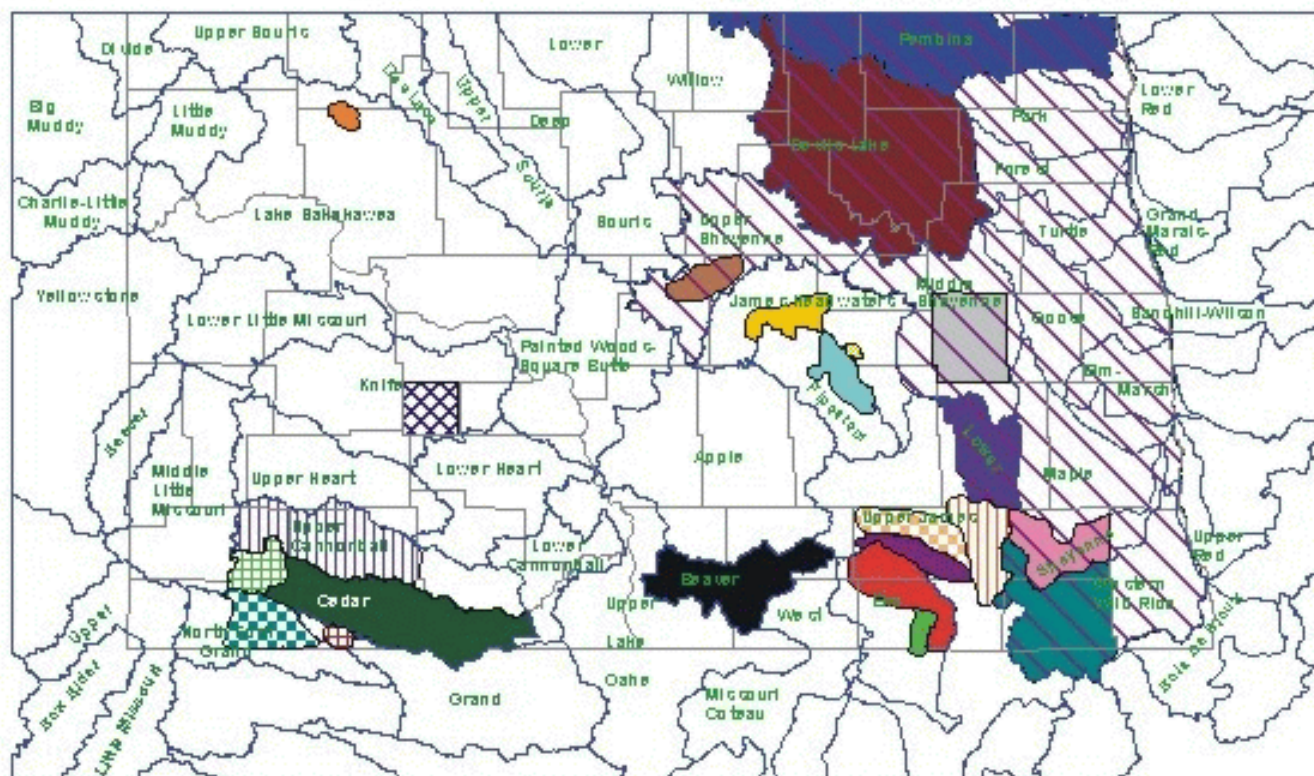
Watershed Project

Grand Total

24

Appendix B
Map of Watershed Project Areas

NPS Management Program – Active Watershed Projects – January 2004



Watershed Projects and Assessments

- UPPER CANNONBALL ASSESSMENT
- NINE TWP WATERSHED PROJ.
- RED RIVER BASIN RIPARIAN PROJECT
- CEDAR LAKE
- BUFFALO LIGHTNING SPRINGS
- MIRROR LAKE
- BEAVER CREEK ASSESSMENT
- CEDAR CREEK
- UPPER SHEYENNE RIVER
- POWERS LAKE
- GREGG COUNTY
- DEVILS LAKE
- SHEYENNE RIVER
- PHEASANT LAKE
- PEMBINA RIVER
- LAKE LAMOUR
- LOWER PHEASANT WATERSHED
- BEAR CREEK ASSESSMENT
- WILD RICE RIVER
- MAPLE RIVER
- ROCKY RUN WATERSHED

Approved Watershed Restoration Action Strategies (WRASs)

- | | | | |
|-----------------|--|---------------------------------|-----------------------|
| BEAVER CREEK | CEDAR CREEK
Middle Cedar, Crooked/Rushy Creek
and Charlie Pals Subwatersheds | UPPER SHEYENNE RIVER | POWERS LAKE |
| GREGG COUNTY | DEVILS LAKE | SHEYENNE RIVER
Barnes County | PHEASANT LAKE |
| PEMBINA RIVER | LAKE LAMOUR
COTTONWOOD CREEK | LOWER PHEASANT WATERSHED | BEAR CREEK ASSESSMENT |
| WILD RICE RIVER | MAPLE RIVER
Dekey & LaMoure Co. | ROCKY RUN WATERSHED | |

Appendix C

Cottonwood Creek Water Quality Data Summary

SUMMARY OF METHODOLOGY AND MONITORING RESULTS

for COTTONWOOD CREEK SITE 380276

To evaluate in-stream benefits of applied BMP and track associated trends in the trophic conditions in Lake LaMoure, a long-term monitoring strategy was initiated in the watershed and lake. The following is a preliminary summary of nine years of monitoring data collected at one of the STORET stations. This particular station is located on the creek's inlet to Lake LaMoure (STORET 380276). The nine years of monitoring data include the assessment year 1995, followed by the eight implementation years of 1997 through 2004. A final year of data collection is also scheduled for 2005.

To facilitate the analysis and reduction of tributary flow, water quality, and load data the FLUX program was employed. The FLUX program, developed by the US Corps of Engineers, Waterways Experiment Station (Walker 1996), is a tool that uses six calculation techniques to estimate the average mass discharge or loading that passes a given river or stream site. FLUX estimates loadings based on grab sample chemical concentrations and continuous daily flow record. Load is therefore defined as mass of a pollutant (e.g., hour, day, month, season, year). The FLUX program allows the user, through various iterations, to select the most appropriate load calculation technique and data stratification scheme, either flow or date, which will give a load estimate with the smallest error, as represented by the coefficient of variation.

For this preliminary review and interpretation, the annual data results for 1997 - 2004 were compared to the results of the 1995 assessment data. Water quality variables investigated for this report are total phosphorus as phosphate, total nitrogen as nitrogen and total suspended solids. It should also be noted that climatic factors such as variations in hydraulic discharge, have not been accounted for in the preliminary data interpretations.

Total Phosphorus

The annual pollutant loads for total phosphorus as phosphate decrease proportional to the decreases in hydraulic discharge (**Table 1**). The decreases per year are 27,117 lbs in 1997, 28,669 lbs in 1998, 1,356 lbs in 1999, 33,282 lbs in 2000, 34,539 lbs in 2001, 48,109 lbs in 2002, 40,819 lbs in 2003, and 42,133 lbs in 2004 for a total reduction of 256,024 lbs of phosphorus over the eight years of the Cottonwood Creek Watershed Project.

Table 1. Cottonwood Creek station 380276 total phosphorus as phosphate per year using the Flux model results, Flux method 6 (Regression 3), with 4 stratifications. Flow duration 3288 days (9 years), mean flow rate 18.251 hm³/yr (4,821.9 million gallons/yr), total flow volume 164.3 hm³ (43,408.1 million gallons). Coefficient of variance equals 0.047

<u>Date</u>	<u>Sample Count</u>	<u>Volume (hm³)</u>	<u>Model</u>			
			<u>Volume (gallons)</u>	<u>Mass (kg)</u>	<u>Mass (lbs)</u>	<u>Conc (p.m.)</u>
1995	26	46.785	12,360.6	23,012	50,742	0.492
1997	19	21.014	5,551.9	10,714	23,624	0.510
1998	25	17.643	4,661.3	10,011	22,074	0.567
1999	45	32.077	8,474.7	16,857	37,169	0.526
2000	26	14.967	3,954.3	7,918	17,459	0.529
2001	37	14.436	3,813.0	7,348	16,202	0.509
2002	15	2.144	566.4	1,194	2,633	0.556
2003	26	8.232	2,174.9	4,501	9,925	0.547
2004	23	7.002	1,849.9	3,904	8,608	0.558

Total Nitrogen

Like total phosphorus the annual pollutant loads for total nitrogen as nitrogen decrease proportional to the decreases in hydraulic discharge (**Table 2**). The decreases per year are 149,246 lbs in 1997, 164,257 lbs in 1998, 92,853 lbs in 1999, 168,784 lbs in 2000, 165,117 lbs in 2001, 239,302 lbs in 2002, 206,071 lbs in 2003, and 213,550 lbs in 2004 for a total reduction of 1,399,180 lbs of nitrogen over the eight years of the Cottonwood Creek Watershed Project. Other species of nitrogen (e. g., ammonia, ammonium, nitrate and nitrite) also declined due to decreases in the annual hydraulic discharge.

Table 2. Cottonwood Creek station 380276 total nitrogen as nitrogen loads per year using the Flux model results, Flux method 2 (Q WTD C), with 4 stratifications. Flow duration 3288 days (9 years), mean flow rate 18.251 hm³/yr (4,821.9 million gallons/yr), total flow volume 164.3 hm³ (43,408.1 million gallons). Coefficient of variance equals 0.056

<u>Date</u>	<u>Sample Count</u>	<u>Volume (hm³)</u>	<u>Model</u>			
			<u>Volume (gallons)</u>	<u>Mass (kg)</u>	<u>Mass (lbs)</u>	<u>Conc (p.m.)</u>
1995	26	46.785	12,360.6	112,926	249,002	2.414
1997	19	21.014	5,551.9	49,726	99,756	2.366
1998	25	17.643	4,661.3	38,349	84,745	2.174
1999	45	32.077	8,474.7	74,692	156,149	2.328
2000	26	14.967	3,954.3	33,290	80,218	2.224
2001	37	14.436	3,813.0	34,340	83,885	2.379
2002	15	2.144	566.4	4,438	9,700	2.070
2003	26	8.232	2,174.9	18,427	42,931	2.238
2004	23	7.002	1,849.9	15,385	35,452	2.197

Total Suspended Solids

Like all the other pollutants the total suspended solids load decrease proportional to the decreases in hydraulic discharge (**Table 3**). The decreases per year are 866.73 tons in 1997, 995.95 tons in 1998, 545.64 tons in 1999, 1,071.44 tons in 2000, 1,052.75 tons in 2001, 1,440.92 tons in 2002, 1,271.55 tons in 2003, and 1,300.2 tons in 2004 for a total reduction of 8,540.18 tons of total suspended solids over the course of eight years of implementing Nonpoint source pollution abatement practices within the Lake LaMoure watershed.

Table 3. Cottonwood Creek station 380276 total suspended solid loads per year using the Flux model results, Flux method 2 (Q W.D. C), with 4 stratifications. Flow duration 3288 days (9 years), mean flow rate 18.251 hm³/yr (4,821.9 million gallons/yr), total flow volume 164.3 hm³ (43,408.1 million gallons). Coefficient of variance equals 0.073

<u>Date</u>	<u>Sample Count</u>	<u>Volume (hm³)</u>	<u>Model</u>			
			<u>Volume (gallons)</u>	<u>Mass (kg)</u>	<u>Mass (tons)</u>	<u>Conc (p.m.)</u>
1995	26	46.785	12,360.6	1,360.96	1,500.46	28.648
1997	19	21.014	5,551.9	579.35	638.73	24.787
1998	25	17.643	4,661.3	457.61	504.52	26.897
1999	45	32.077	8,474.7	866.06	954.83	27.629
2000	26	14.967	3,954.3	389.14	429.03	25.224
2001	37	14.436	3,813.0	406.09	447.71	28.081
2002	15	2.144	566.4	54.01	59.55	27.622
2003	26	8.232	2,174.9	207.63	228.91	28.016
2004	23	7.002	1,849.9	181.65	204.35	29.667

Appendix D

Specific Practices Implemented Under Each BMP Category

Category & PracticesAmountUnitsCostProducer MatchTotal Cost***Copeland Management***

NPS Equipment (Nutrient Management)	3.00	Number			
			\$3,435.63	\$2,290.42	\$5,726.05
Nutrient Management	55,773.10	Acres			
			\$137,263.26	\$91,508.50	\$228,771.76
Pasture/Harland Planting	371.80	Acres			
			\$6,882.92	\$4,588.61	\$11,471.53
Pest Management	18,880.50	Acres			
			\$39,136.87	\$26,090.58	\$65,227.45
Residue Management (Mulch Till)	34,518.00	Acres			
			\$149,548.22	\$99,698.51	\$249,246.73
Residue Management (No-Till and Strip Till)	47,125.90	Acres			
			\$312,895.36	\$210,657.24	\$523,552.60
Soil Test (Nutrient Management)	36.00	Number			
			<u>\$1,213.32</u>	<u>\$808.88</u>	<u>\$2,022.20</u>
			Total	\$435,642.74	\$1,086,018.32

Erosion Control

Critical Area Planting	627.10	Acres			
			\$113,394.62	\$75,596.41	\$188,991.03
Grassed Waterway	550.00	Linear Feet			
			<u>\$8,226.90</u>	<u>\$5,484.60</u>	<u>\$13,711.50</u>
			Total	\$81,081.01	\$202,702.53

Grazing Management

Fencing	655,768.90	Linear Feet			
			\$284,966.53	\$189,973.69	\$474,940.22
Miscellaneous	1.00	System(s)			
			\$2,280.24	\$1,520.16	\$3,800.40
Pasture/Harland Planting	4,396.40	Acres			
			\$85,109.76	\$56,740.51	\$141,850.27
Pipelines	130,709.00	Linear Feet			
			\$143,401.82	\$95,601.54	\$239,003.36
Pond	43.00	Number			
			\$43,126.93	\$28,751.29	\$71,878.22
Prescribed Grazing	320.00	Acres			
			\$960.00	\$640.00	\$1,600.00
Range Planting	34.40	Acres			
			\$1,037.40	\$691.60	\$1,729.00
Solar Pumps	2.00	Number			
			\$6,906.60	\$4,604.40	\$11,511.00
Trough and Tank	72.00	Number			
			\$56,287.76	\$37,524.15	\$93,811.91
Use Exclusion	10.00	Acres			

Well (Livestock Only)	19.00	Number	\$1,993.00	\$1,328.66	\$3,321.66
			<u>\$50,872.72</u>	<u>\$33,915.15</u>	<u>\$84,787.87</u>
		Total	\$676,942.76	\$451,291.15	\$1,128,233.91
<i>Livestock Manure Management System (Full System)</i>					
Cultural Resource Review	2.00	Number	\$611.56	\$407.70	\$1,019.26
Phase I Waste Management System	6.99	System(s)	\$337,903.74	\$225,268.81	\$563,172.55
Phase II Waste Management System	2.40	System(s)	\$80,748.38	\$53,832.26	\$134,580.64
Phase III Waste Management System	0.40	System(s)	\$46,983.00	\$31,322.00	\$78,305.00
Waste Management System (Full System Completed)	8.00	System(s)	<u>\$345,292.73</u>	<u>\$230,195.16</u>	<u>\$575,487.89</u>
		Total	\$811,539.41	\$541,025.93	\$1,352,565.34
<i>Livestock Manure Management System (Partial System)</i>					
Building Relocation, Moving Costs (Ag Waste)	1.00	Number	\$24,160.36	\$16,106.91	\$40,267.27
Bunk Line Fencing (Ag Waste)	1,920.00	Linear Feet	\$2,880.00	\$1,920.00	\$4,800.00
Diversion	800.00	Linear Feet	\$3,243.39	\$2,162.26	\$5,405.65
Perimeter Fencing (Ag Waste)	6,905.00	Linear Feet	\$5,963.28	\$3,975.52	\$9,938.80
Phase II Waste Management System	0.10	System(s)	\$10,810.41	\$7,206.94	\$18,017.35
Waste Storage Facility	1.00	System	\$1,650.00	\$1,100.00	\$2,750.00
Waste Utilization	5,756.00	Acres	\$72,021.71	\$48,188.98	\$120,210.69
Watering Facility (Ag Waste: Tank, Pipeline, Well)	1.00	System(s)	\$2,400.00	\$1,600.00	\$4,000.00
Windbreak Fencing (Ag Waste)	400.00	Linear Feet	<u>\$1,920.00</u>	<u>\$1,280.00</u>	<u>\$3,200.00</u>
		Total	\$125,049.15	\$83,540.61	\$208,589.76
<i>Miscellaneous Practices</i>					
Cultural Resource Review	1.00	Number	\$528.00	\$352.00	\$880.00
Engineering Services - Construction Phase	1.00	System(s)	\$380.16	\$253.44	\$633.60
Engineering Services - Preconstruction	1.00	Number	\$143.25	\$95.50	\$238.75

Miscellaneous	3,311.00	System(s)			
			\$3,094.74	\$2,063.16	\$5,157.90
Soil Investigations	1.00	Number			
			\$443.22	\$295.48	\$738.70
Solar Pumps	2.00	Number			
			\$2,290.11	\$1,526.74	\$3,816.85
Urban Stormwater Management	1.00	System			
			\$160,880.98	\$107,253.97	\$268,134.95
Well Decommissioning	14.00	Number			
			<u>\$10,992.47</u>	<u>\$7,327.99</u>	<u>\$18,320.46</u>
		Total	\$178,752.93	\$119,168.28	\$297,921.21
<i>Riparian Area Management</i>					
Engineering Services - Preconstruction	2.00	System			
			\$6,192.15	\$4,128.11	\$10,320.26
Riparian Forest Buffer	12,238.00	Acres			
			\$27,189.46	\$18,126.30	\$45,315.76
Riparian Herbaceous Cover	13.00	Acres			
			\$2,530.83	\$1,687.23	\$4,218.06
Streambank and Shoreline Stabilization	4,095.00	Linear Feet			
			\$83,451.17	\$55,634.11	\$139,085.28
Tree Handplants	1,833.00	Number			
			<u>\$1,339.80</u>	<u>\$893.20</u>	<u>\$2,233.00</u>
		Total	\$120,703.41	\$80,468.95	\$201,172.36
<i>Upland Tree Planting</i>					
Cultural Resource Review	1.00	Number			
			\$917.56	\$611.71	\$1,529.27
Site Preparation - Heavy w/Chemical (Trees, G13)	32.20	Acres			
			\$540.96	\$360.64	\$901.60
Tree/Shrub Establishment	135,068.34	Linear Feet			
			\$19,702.53	\$13,134.69	\$32,837.22
Weed Control For Tree Establishment (Chem or Mech)	32.20	Acres			
			\$369.00	\$246.00	\$615.00
Windbreak/Shelterbelt	46,682.00	Linear Feet			
			<u>\$7,204.43</u>	<u>\$4,804.19</u>	<u>\$12,008.62</u>
		Total	\$28,734.48	\$19,157.23	\$47,891.71
<i>Wetland Restoration/Creation</i>					
Wetland Restoration	781.50	Acres			
			<u>\$68,454.76</u>	<u>\$45,636.51</u>	<u>\$114,091.27</u>
		Total	\$68,454.76	\$45,636.51	\$114,091.27
Grand Total			\$2,782,174.00	\$1,857,012.41	\$4,639,186.41